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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,433	12/28/2001	Young-Sang Byun	3430-0175P	4398
2292	7590	07/22/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			DUONG, THOI V	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,433

Applicant(s)

BYUN ET AL.

Examiner

Thoi V Duong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10 and 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 08, 2004 has been entered.

Accordingly, claims 1 and 9 were amended. Currently, claims 1, 2, 4-10 and 12-14 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 2 and 4-8 have been considered but are moot in view of the new ground(s) of rejection. However, claims 9, 10 and 12-14 stand rejected with a same ground where the reference of Hashimoto et al. discloses an on-off voltage applied to the apparatus being adjusted according to a position of the moving substrate.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1, 2 and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masazumi et al. (USPN 6,331,884 B1) in view of Gyoda (Pub. No. US 2002/0063842 A1) and Hashimoto et al. (USPN 6,583,848 B2).

Re claim 1, as shown in Figs. 5, 6(A) and 6(B), Masazumi et al. discloses a method of forming a liquid crystal layer on a substrate 5A having a sealed pattern 9b', comprising:

preparing a liquid crystal material in a projecting portion consisting of liquid crystal reservoirs S2, S3, S4 and nozzles N2, N3, N4;

emit the liquid crystal material 9a, 9a', 9a" from the projecting portion;

moving the substrate in one direction; and

depositing the emitted liquid crystal material uniformly onto the substrate during the movement of the substrate in the one direction (col. 18, lines 13-40),

wherein, re claim 7, the substrate has a black matrix 8 under the sealed pattern; and

where, re claim 8, the liquid crystal material start and stop is deposited on a black matrix 8.

Masazumi et al. discloses a method of forming a liquid crystal layer on a substrate that is basically the same as that recited in claim 1 except for applying a vibration and pressure to the projecting portion to emit the liquid crystal material from the projection portion and adjusting an on-off voltage according to a position of the moving substrate.

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At first, as shown in Figs. 4, 6 and 7, Gyoda discloses a method of forming a liquid crystal layer 13 on a counter substrate 112A having a sealed pattern 14A, comprising (paragraphs 108-110, page 9):

applying a vibration and pressure to a projecting portion 50 (ink-jet nozzle) so as to emit a liquid crystal material 61 from the projecting portion,

wherein, re claim 2, the projecting portion consisting of a reservoir plate 53 filled with a liquid crystal material, a plurality of spaces 54, a nozzle plate 51 containing a plurality of orifices 57 for discharging the liquid crystal from the space 54, wherein said nozzle plate adjusts the applied pressure for emitting the liquid crystal material;

wherein, re claim 4, the liquid crystal material is emitted and deposited in a vacuum chamber (paragraph 98, page 8);

wherein, re claim 5, the vibration is generated by a voltage applied to a resonator 59; and

wherein, re claim 6, the generated vibration is transmitted to the projecting portion through a resonating plate 52.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of forming a liquid crystal layer on a substrate of Masazumi et al. with the teaching of Gyoda by applying a vibration and pressure to the ink-jet nozzle so as to reliably and continuously discharge the liquid crystal material (page 3, paragraph 35).

Further, as shown in Figs. 12-15, Hashimoto et al. discloses a manufacturing apparatus of a liquid crystal device having a stage 31 used for mounting a substrate 21a

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and a driving mechanism comprising a driving source 36 for driving the stage and a position detector 37 (a photosensor or a limit switch) for sending a control signal to the driving source 37 (col. 13, lines 45-53 through col. 14, lines 12-15). Accordingly, it is obvious that the driving source is operated by a voltage which is adjusted on or off in accordance with a control signal from the position detector used to detect a position of the moving substrate mounted on the stage.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of forming a liquid crystal layer on a substrate having a seal pattern of Masazumi et al. with the teaching of Hashimoto et al. by adjusting an on-off voltage according to a position of the moving substrate in order to produce a mass-production of liquid crystal display devices (col. 3, lines 13-15).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gyoda (Pub. No. US 2002/0063842 A1) in view of Masazumi et al. (USPN 6,331,884 B1) and Hashimoto et al. (USPN 6,583,848 B2).

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Re claims 9 and 10, Gyoda discloses an apparatus of forming a liquid crystal layer on a substrate having a seal pattern as shown in Figs. 6 and 7, comprising (paragraphs 108-110, page 9):

a projecting portion consisting of a reservoir plate 53 filled with a liquid crystal material, a plurality of spaces 54, a nozzle plate 51 containing a plurality of orifices 57 for discharging the liquid crystal from the space 54;

a resonator 59 for generating a vibration; and

a resonating plate 52 for transmitting the vibration to the projecting portion.

wherein the nozzle plate adjusts the applied pressure for emitting the liquid crystal material (paragraph 108); and

wherein, re claim 14, voltage means are provided for generating vibration in the resonator (paragraph 109).

Finally, re claim 13, the apparatus further comprises a vacuum chamber for encompassing the projecting portion, the resonator and the resonating plate (paragraph 98, page 8).

Gyoda discloses an apparatus of forming a liquid crystal layer on a substrate having a seal pattern that is basically the same as that recited in claims 9 and 12 except for a stage for moving the substrate in one direction during emitting of the liquid crystal material from the projecting portion uniformly onto the substrate, wherein an on-off of voltage applied to said apparatus is adjusted according to a position of the moving substrate; and means for moving the stage.

At first, as shown in Figs. 5, 6(A) and 6(B), Masazumi et al. discloses a method of forming a liquid crystal layer on a substrate 5A having a sealed pattern 9b', comprising:

preparing a liquid crystal material in a projecting portion consisting of liquid crystal reservoirs S2, S3, S4 and nozzles N2, N3, N4;

emit the liquid crystal material 9a, 9a', 9a" from the projecting portion;

moving the substrate in one direction; and

depositing the emitted liquid crystal material uniformly onto the substrate during the movement of the substrate in the one direction (col. 18, lines 13-40),

Further, as shown in Figs. 12-15, Hashimoto et al. discloses a manufacturing apparatus of a liquid crystal device having a stage 31 used for mounting a substrate 21a and a driving mechanism comprising a driving source 36 for driving the stage and a position detector 37 (a photosensor or a limit switch) for sending a control signal to the driving source 37 (col. 13, lines 45-53 through col. 14, lines 12-15). Accordingly, it is obvious that the driving source is operated by a voltage which is adjusted on or off in accordance with a control signal from the position detector used to detect a position of the moving substrate mounted on the stage.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus for forming a liquid crystal layer on a substrate having a seal pattern of Gyoda with the teachings of Masazumi et al. and Hashimoto et al. by providing a stage for moving the substrate in one direction during emitting of the liquid crystal material from the projecting portion uniformly onto the

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substrate and means for moving the stage, wherein an on-off of a voltage applied to the apparatus is adjusted according to a position of the moving substrate so as to produce a mass-production of liquid crystal display devices (col. 3, lines 13-15).


Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong

07/17/2004


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER